

**Sperm whale, North Pacific***Physeter macrocephalus*

Class: Mammalia

Order: Cetacea

**Conservation Status***Heritage*      *Agency*

G Rank: G3G4

USFWS/NOAA: Listed Endangered

BLM:

AA:

S Rank: S3S4

SOA: Species of Greatest Conservation Need

USFS:

IUCN: Vulnerable

<b>Final Rank</b>		
Conservation category: <b>VIII. Yellow</b>		
VIII = low status and either high biological vulnerability or high action need		
<u>Category</u>	<u>Range</u>	<u>Score</u>
Status:	-20 to 20	2
Biological:	-50 to 50	-15
Action:	-40 to 40	-8
<b>Higher numerical scores denote greater concern</b>		

**Status** - variables measure the trend in a taxon's population status or distribution. Higher status scores denote taxa with known declining trends. Status scores range from -20 (increasing) to 20 (decreasing).

**Score***Population Trend (-10 to 10)*

2

Reliable information on trends in abundance for this stock is currently not available. Whaling caused major reduction in sperm whale populations worldwide. Approximately 1,110,000 - 1,260,000 sperm whales reported in the North Pacific prior to exploitation, which reduced populations to 930,000 by the late 1970s (harvest peaked at about 29,000/year in the mid-1960s; Rice 1989, Whitehead 2003). Current population approximately 360,000 whales, a 68% decline since commercial whaling was initiated (Whitehead 2003).

*Distribution Trend (-10 to 10)*

0

Unknown.

Status Total: 2

**Biological** - variables measure aspects of a taxon's distribution, abundance and life history. Higher biological scores suggest greater vulnerability to extirpation. Biological scores range from -50 (least vulnerable) to 50 (most vulnerable).

**Score***Population Size (-10 to 10)*

0

An estimated 102,112 sperm whales occur in the western North Pacific; however, the number of whales from the North Pacific population that occur in Alaska is unknown.

*Range Size (-10 to 10)*

-10

During summer, males are found along the shelf edge in the Gulf of Alaska, Aleutian Islands and in the deeper waters of the southeastern Bering Sea (Gosho et al. 1984). The shallow continental shelf bars movements into the northeastern Bering Sea and Arctic Ocean (Rice 1989). Generally prefer deep water and remain well offshore. Females and young stay in warmer water to the south; seldom, if ever, seen north of 50 degrees N latitude in the southern Gulf of Alaska (Gosho et al. 1984, Reeves and Whitehead 1997, Perry et al. 1999). Occasional occurrences of females as far north as the Aleutian Islands may be the result of exceptional incursions of warm water to high latitudes (Reeves and Whitehead 1997).

*Population Concentration (-10 to 10)*

-10

Does not concentrate.

*Reproductive Potential*

<b><u>Age of First Reproduction (-5 to 5)</u></b>	4
Females sexually mature at 7-11 years; pregnancy rate gradually declines after age 14. Males may not breed until about 25 years old.	
<b><u>Number of Young (-5 to 5)</u></b>	5
Single young is produced every 3-6 years.	
<b><i>Ecological Specialization</i></b>	
<b><u>Dietary (-5 to 5)</u></b>	1
Eats primarily medium to large squids, sometimes also octopus and various fishes. Large males at high latitudes also take large quantities of demersal and mesopelagic sharks, skates and fishes (Gosho et al. 1984, Jefferson et al. 1993, Perry et al. 1999, Whitehead 2003). Dives deeply when foraging, some dives over 1800 m have been recorded, but most are less than 500 m (Potter and Birchler, in Wilson and Ruff 1999).	
<b><u>Habitat (-5 to 5)</u></b>	-5
Pelagic, prefers deep water, sometimes around islands or in shallow shelf waters (e.g., 40-70 m; Scott and Sadove 1997). Tend to occur in highest densities near productive waters, and often near steep drop-offs or strong oceanographic features, e.g. edges of continental shelves, large islands, and offshore banks and over submarine trenches and canyons (Gosho et al. 1984, Reeves and Whitehead 1997, Gregr and Trites 2001, Whitehead 2003).	
Biological Total:	-15
<b>Action</b> - variables measure current state of knowledge or extent of conservation efforts directed toward a given taxon. Higher action scores denote greater information needs due of lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs).	<b>Score</b>
<b><i>Management Needs (-10 to 10)</i></b>	-10
Listed as endangered under the ESA and depleted under the MMPA: any harvest, including subsistence, is now prohibited, and other causes of human-caused mortality monitored and managed.	
<b><i>Monitoring Needs (-10 to 10)</i></b>	10
Not monitored.	
<b><i>Research Needs (-10 to 10)</i></b>	2
Historically hunted for spermaceti, ambergris, and oil. No longer threatened by direct catching, but entanglement in fishing gear may cause mortality in some areas. Fisheries interactions, entanglement, and direct competition for prey are a concern for large whales (Whitehead 2003). Sperm whale interactions with longline fisheries operating in the Gulf of Alaska may be increasing in frequency (Hill and Mitchell 1998). Observers aboard sablefish, <i>Anoplopoma fimbria</i> , and halibut, <i>Hippoglossus stenolepis</i> , longline vessels have documented sperm whales feeding on longline caught fish (Hill et al. 1999, Perry et al. 1999). During a study conducted in the Gulf of Alaska (1997 and 1998), depredation was recorded during 46% of 160 sets in which sperm whales were present over the same time period (Hill et al. 1999). Longline depredation by sperm whales is restricted to Gulf of Alaska waters east of Kodiak; however, longline vessels in Southeast Alaska are also commonly visited by sperm whales. Although whales clearly impact the longline fishery, the current level of impact is unknown (Hill et al. 1999). In 1997, the first entanglement of a sperm whale in Alaska's longline fishery was recorded, although no serious injuries resulted (Hill and DeMaster 1999 in Perry et al. 1999, Straley pers. comm. 2004); no evidence of mortality or serious injury as a result of fisheries interactions has been reported (Hill et al. 1999, Perry et al. 1999).	
Potentially threatened by ocean pollution and ingestion of plastics. May be particularly sensitive to noise pollution, resulting in changes in behavior and distribution in response to unnatural low-frequency sounds (i.e. underwater pulses made by pingers or submarine sonar, seismic testing with air guns, close approaches by survey vessels and high-speed whale watching vessels) (Reeves and Whitehead 1997, Perry et al. 1999, Whitehead 2003). It is unknown what effects oil production platforms and associated vessels have on the species (Perry et al. 1999).	
Effects of global warming are unknown, but the impact is suspected to be serious (Whitehead 2003). Off the Galapagos Islands, sperm whales have greatly reduced feeding success when sea temperatures were warmer than average, as during El Nino years (Whitehead 2003).	
Commercial exploitation caused major reductions in sperm whale populations worldwide (Reeves et al. 2002). While sperm whales are still fairly numerous, the selective killing of the larger breeding age males over many years upset the male-to-female ratio, and the birth rate has seriously declined in some populations (Reeves and Whitehead 1997).	

Genetic studies needed to determine stock structure in Alaska, from samples of stranded and live whales using biopsy techniques. Research needed to assess the degree of interaction with longline fisheries and evaluate impacts to both whales and fisheries. Studies needed to assess adverse effects of anthropogenic noise and potential conflicts between commercial and recreation vessels.

#### Survey Needs (-10 to 10)

-10

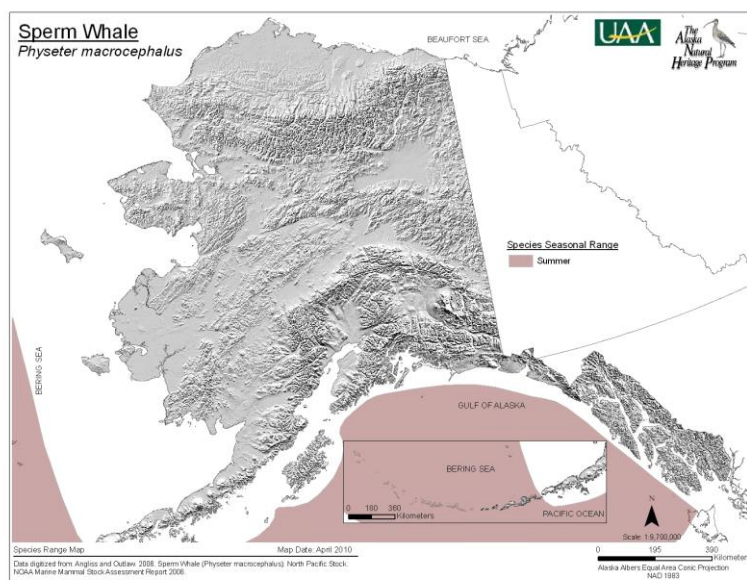
Sightings surveys conducted by NMML between 2001 and 2006 found that sperm whales were the most frequently sighted large cetacean in the coastal waters around the central and western Aleutian Islands (NMML unpublished data in Angliss and Outlaw 2006). Acoustic surveys detected the presence of sperm whales year-round in the Gulf of Alaska (Mellinger et al. 2004). Habitat associations are also well understood.

Action Total: -8

**Supplemental Information** - variables do not receive numerical scores. Instead, they that are used to sort taxa to answer specific biological or managerial questions.

<b>Harvest:</b>	None or Prohibited
<b>Seasonal Occurrence:</b>	Nonbreeding
<b>Taxonomic Significance:</b>	Monotypic species
<b>% Global Range in Alaska:</b>	<10%
<b>% Global Population in Alaska:</b>	<25%
<b>Peripheral:</b>	No

#### Range Map



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For details on the development of the ASRS and criteria, please see: Gotthardt, T. A., K. M. Walton, and T. L. Fields. 2012. *Setting Conservation Priorities for Alaska's Wildlife Action Plan*. Alaska Natural Heritage Program, University of Alaska Anchorage, AK.